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Reference is made to three drawings intended to accompany the paper, but the first of these drawings only was received with the paper.

June 3, 1847.

The MARQUIS OF NORTHAMPTON, President, in the Chair.

The Right Hon. Viscount Morpeth was elected into the Society.

A paper was read, entitled "On a Function of the Red Corpuscles of the Blood, and on the Process of Arterialization." By George Owen Rees, M.D., F.R.S. &c.

The author states that he was first led to the new theory he has formed for the explanation of the chemical phenomena of respiration, and more especially of the change in the colour of the blood which occurs in that process, by having observed that a garlick odour, similar to that evolved from phosphorus, was produced by agitating in distilled water the clot obtained from some specimens of venous blood. His attention was consequently directed to the investigation of the state in which the phosphorus exists in the blood; and the result of that investigation was the theory, of which the following is a succinct outline.

The venous corpuscles are known to contain fat in combination with phosphorus. This compound ingredient of the corpuscles, on coming into contact with atmospheric oxygen during the respiratory act, is consumed, and combining with that oxygen, forms the carbonic acid and water which are expired, and also phosphoric acid, which, uniting with the alkali of the liquor sanguinis, forms a tribasic phosphate of soda. This salt, like many others, acts upon haematosine in such a manner as to produce the well-known bright arterial tint.

The analyses which the author has performed in order to test the correctness of this theory were made upon the blood, both of the veins and of the arteries of the same animal; and also upon separated portions of the same venous blood; one of which portions had been artificially arterialized by having been brought into contact with air, while the other portion had not been so exposed. These comparative experiments showed that arterial blood, both when obtained from the vessels and when artificially produced, contains in its serum a larger proportion of tribasic phosphate of soda than that obtained from the veins. The venous corpuscles, as they are contained in the clot, yield a fatty matter combined with phosphorus; while those from arterial blood yield a fat, the ashes of which manifest an alkaline reaction. Thus the venous corpuscles are shown to be acted upon both by respiration and by the artificial arterialization of the blood, in such a manner as to lead to the formation of tribasic phosphate of soda at the expense of the phosphorus they contain.

No exact quantitative analyses were attempted by the author, the comparative experiments having been performed on small portions only of serum (from 25 to 40 grains); sufficiently large, however, to furnish satisfactory evidence of the actual presence of the phosphate in arterial blood, and also in those portions of venous blood which had been arterialized out of the body; while no such indications were obtained from similar portions of the blood contained in the veins.

At the conclusion of the paper, the author notices the experiments of Enderlin, in which no alkaline carbonate could be detected in the ashes of blood; and shows that this is the natural consequence of the phosphates of the clot being oxidized during combustion, and thus supplying a quantity of phosphoric acid sufficient to decompose completely the alkaline carbonate produced by the incineration of the lactate and albuminate of the serum. Most specimens of serum, even as obtained from arterial blood, yield an alkaline carbonate when incinerated; and this is always the case with the serum of venous blood. The author, therefore, thinks himself warranted in regarding the conclusion founded on Enderlin's experiments, that the blood contains no lactate, as being erroneous.

June 17, 1847.

The MARQUIS OF NORTHAMPTON, President, in the Chair.

1. "Electro-Physiological Researches, 5th, 6th, and 7th Series." By Signor Carlo Matteucci, Professor in the University of Pisa. Communicated by Michael Faraday, Esq., D.C.L., F.R.S., &c.

The fifth series of these researches contains the sequel of the author's investigations of *induced contractions*, which, in his third memoir, published in the Philosophical Transactions for 1845, he had considered as being due to nervous influence acting through the muscles during their contraction, and was therefore referable to a kind of nervous induction, and not to the generation of any electric current by muscular contraction. From the experiments related in the present paper, he is led to the conclusion that the phenomena of induced contraction belong exclusively to the muscle in the state of contraction. He now, however, finds reason for doubting that the fact is established that induced contractions are not due to an electric discharge produced during the contraction of the muscle.

The second section of this memoir relates to the phenomena elicited by the passage of the electric current through the nerves of a living animal, or of one recently killed, according to the direction of the current. He finds that in whatever manner the current passing through the nerve of the inverse limb is arrested, tetanic contraction is excited. In order to produce this effect, it is sufficient to moisten the nerve with a large drop of water, or to double it